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Original Research Article

EARLY VS. DELAYED FEEDING AFTER GASTROINTESTINAL SURGERY: A PROSPECTIVE ANALYSIS OF PATIENT RECOVERY AND OUTCOMES

Ikram Ilahi[1], Ritika Garg[1], Tausif Ahmed Khan[1], Girdhar Gopal Gupta[1]

[1]*Assistant Professor, Department of General Surgery, Shri Venkateshwara University, Gajraula, Amroha, India.*

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Corresponding Author:
Dr. Girdhar Gopal Gupta,
Assistant Professor, Shri Venkateshwara University, Gajraula, Amroha, India.
Email: drgggupta@gmail.com

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ABSTRACT

Background: Aim: This study aimed to evaluate the impact of early versus delayed feeding on postoperative recovery and outcomes in patients undergoing gastrointestinal (GI) surgery.

Material and Methods: A prospective randomized study was conducted on 120 patients who underwent elective GI surgery at a tertiary care hospital. Patients were randomized into two groups: the Early Feeding Group (EFG), who received oral intake within 24 hours postoperatively, and the Delayed Feeding Group (DFG), who remained nil per os (NPO) for at least 48 hours. Standardized perioperative care was provided to all patients, and outcomes were assessed through clinical observations and statistical analysis using SPSS version 25.0.

Results: Patients in the early feeding group had significantly shorter times to first flatus (33.60 ± 5.80 hours vs. 47.10 ± 7.10 hours, $p<0.001$) and first bowel movement (55.20 ± 6.30 hours vs. 70.50 ± 8.20 hours, $p<0.001$). The length of hospital stay was significantly reduced in the EFG (6.80 ± 1.20 days) compared to the DFG (8.40 ± 1.50 days, $p<0.001$). The incidence of postoperative ileus was lower in the early feeding group (8.33% vs. 21.67%, $p=0.03$). Patient satisfaction scores were also significantly higher in EFG (8.50 ± 1.10 vs. 7.20 ± 1.30, $p<0.001$). There were no significant differences in anastomotic leak rates, infection rates, or other major complications between the groups.

Conclusion: Early feeding after GI surgery is associated with faster recovery, shorter hospital stays, and a lower incidence of postoperative ileus without increasing the risk of complications. These findings support the integration of early nutrition into postoperative care protocols, particularly in the context of enhanced recovery after surgery (ERAS) programs. However, individualized patient assessment remains crucial for ensuring safety in high-risk cases.

Keywords: Early feeding, delayed feeding, gastrointestinal surgery, postoperative recovery, enhanced recovery after surgery (ERAS).

INTRODUCTION

Gastrointestinal (GI) surgery encompasses a range of procedures aimed at treating conditions affecting the stomach, intestines, and associated organs. These surgeries are often complex and require careful postoperative management to ensure optimal recovery and reduce complications. One of the key considerations following GI surgery is the timing of postoperative feeding. Traditionally, patients have been kept nil per os (NPO) for several days after surgery to allow the gut to rest and heal. However, more recent research and clinical practices have challenged this approach, advocating for early feeding to enhance recovery.[1]

Early feeding refers to the initiation of oral or enteral nutrition within 24 to 48 hours after surgery, while delayed feeding involves withholding food for a longer period, typically until the return of bowel function, as indicated by the presence of bowel sounds, passage of flatus, or stool. The debate between early and delayed feeding stems from

concerns over potential complications such as anastomotic leakage, aspiration, and ileus, versus the potential benefits of early nutrition in promoting gut motility, reducing infection risks, and shortening hospital stays.[2] The traditional practice of delaying oral intake postoperatively is based on the assumption that allowing time for bowel rest will prevent complications such as anastomotic dehiscence and paralytic ileus. In many surgical protocols, particularly in older models of care, patients were not given food until there was clear evidence of bowel function returning. This approach was largely based on historical practices rather than strong clinical evidence. The rationale behind delayed feeding is that surgery, especially on the intestines, disrupts the normal peristaltic activity of the gut. The trauma of surgery, anesthesia, and opioid analgesia all contribute to temporary gut dysmotility, raising concerns that early feeding could exacerbate these issues. Conversely, emerging evidence has demonstrated that early feeding may be not only safe but also beneficial for recovery. The gut plays a crucial role in immune function, and prolonged fasting can contribute to mucosal atrophy, increased intestinal permeability, and a higher risk of infections, including sepsis. Early feeding stimulates the production of gastrointestinal hormones, enhances blood flow to the gut, and promotes the return of normal bowel motility. Furthermore, it helps prevent catabolic states, which can lead to muscle wasting and delayed wound healing. Enhanced Recovery After Surgery (ERAS) protocols, which are widely implemented in modern surgical care, emphasize the importance of early oral intake as part of a multimodal strategy to improve patient outcomes.[3] One of the primary concerns with early feeding is the risk of anastomotic leakage, where the surgical connection between two segments of the bowel fails to heal properly. Surgeons and clinicians have long feared that increased intraluminal pressure from early food intake could compromise the integrity of an anastomosis, leading to severe complications. However, studies have suggested that there is no significant increase in anastomotic leakage rates with early feeding compared to delayed feeding. In fact, withholding nutrition for too long may impair the healing process, as adequate nutrient supply is crucial for tissue regeneration. Another potential complication following GI surgery is postoperative ileus, a temporary cessation of bowel motility that leads to bloating, nausea, vomiting, and delayed recovery. Traditionally, the absence of bowel sounds or flatus was used as an indicator of when to resume feeding. However, recent evidence suggests that waiting for these signs may not be necessary. Early feeding has been associated with a reduced incidence of postoperative ileus, as the presence of food in the digestive tract can help stimulate peristalsis and restore gut function more quickly.[4] Nutritional status is another critical factor influencing surgical outcomes. Malnourished patients are particularly vulnerable to poor wound healing, infections, and longer hospital stays. Delayed feeding may exacerbate these risks by prolonging periods of inadequate nutritional intake. Early feeding ensures that patients receive essential nutrients needed for recovery, reducing the likelihood of malnutrition-related complications. Additionally, maintaining gut integrity through early enteral nutrition can prevent bacterial translocation, where harmful bacteria from the gut migrate into the bloodstream, leading to sepsis. Hospital length of stay and overall recovery time are important considerations in evaluating postoperative feeding strategies. Studies have indicated that patients who receive early feeding tend to have shorter hospital stays and recover more quickly than those subjected to prolonged fasting. Early oral intake reduces dependency on intravenous fluids and parenteral nutrition, which can contribute to fluid overload and metabolic imbalances. Furthermore, shorter hospital stays can lower healthcare costs and minimize the risk of hospital-acquired infections, benefiting both patients and healthcare systems.[5] Despite the growing support for early feeding, it is essential to recognize that not all patients are suitable candidates for this approach. The decision to initiate feeding early must be individualized based on the patient's condition, type of surgery performed, and risk factors for complications. Patients undergoing complex procedures such as esophagectomy, pancreaticoduodenectomy, or extensive bowel resections may require more cautious nutritional management. Additionally, patients with severe postoperative complications, such as bowel obstruction, prolonged ileus, or hemodynamic instability, may not tolerate early feeding and should be managed accordingly.[6] The evolving understanding of postoperative feeding has led to significant changes in clinical practice, with many surgical teams now advocating for early enteral nutrition as part of an enhanced recovery pathway. While there is still some debate regarding the optimal timing for initiating oral intake, the trend toward early feeding is gaining widespread acceptance due to its potential benefits in improving patient outcomes. Further research and larger clinical trials are needed to refine guidelines and establish clear protocols for different surgical scenarios.[7] The choice between early and delayed feeding after GI surgery remains a critical aspect of postoperative care. While traditional approaches favored delaying nutrition until bowel function resumed, modern evidence suggests that early feeding can promote faster recovery, reduce complications, and shorten hospital stays. However, patient selection is crucial, and clinical judgment should guide the decision-making process.

MATERIALS AND METHODS

This prospective study was conducted to evaluate the impact of early versus delayed feeding on postoperative recovery and outcomes in patients undergoing gastrointestinal (GI) surgery. A total of 120 patients who underwent elective GI surgery at tertiary care hospital were enrolled. Patients were included if they were 18 years or older, had an ASA (American Society of Anesthesiologists) score of I–III, and underwent elective gastrointestinal procedures such as gastrectomy, bowel resection, or colorectal surgery. Exclusion criteria included emergency surgeries, underlying gastrointestinal motility disorders, prolonged intensive care unit (ICU) stay (>48 hours), and inability to tolerate oral intake due to complications. The study was approved by the Institutional Review Board (IRB) of Institution, and all patients provided written informed consent before participation. The study adhered to Declaration of Helsinki guidelines.

Group Allocation

- Patients were randomly assigned to one of two groups:
- Early Feeding Group (EFG) (n=60): Patients received oral intake within 24 hours postoperatively.
- Delayed Feeding Group (DFG) (n=60): Patients were kept on nil per os (NPO) for at least 48 hours, after which feeding was gradually introduced based on clinical judgment.

Randomization was performed using a computer-generated sequence, and allocation was concealed until after surgery.

All patients received standardized perioperative care, including preoperative fasting per institutional guidelines, intraoperative fluid management to prevent fluid overload, postoperative pain control using a multimodal analgesia approach, and early mobilization in line with enhanced recovery after surgery (ERAS) principles. In the early feeding group, clear liquids were introduced within 24 hours postoperatively and gradually progressed to a soft diet based on patient tolerance. Conversely, the delayed feeding group remained nil per os (NPO) for at least 48 hours, after which diet advancement followed standard clinical protocols. The primary outcomes assessed included time to first flatus and bowel movement (in hours), length of hospital stay (LOS in days), and the incidence of postoperative ileus. Secondary outcomes included postoperative complications such as anastomotic leak, infection, nausea, or vomiting, readmission rates within 30 days, and patient-reported pain and satisfaction scores.

Statistical Analysis

Patient demographics, intraoperative details, and postoperative recovery parameters were collected prospectively. Statistical analysis was performed using SPSS version 25.0, with continuous variables compared using Student's t-test or Mann-Whitney U test, and categorical variables analyzed using chi-square or Fisher's exact test, as appropriate. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1: Patient Demographics

The baseline characteristics of the two groups, Early Feeding Group (EFG) and Delayed Feeding Group (DFG), were comparable. The mean age of patients in the early feeding group was 56.30 ± 9.20 years, whereas in the delayed feeding group, it was 57.10 ± 8.80 years (p=0.62), indicating no significant difference. The gender distribution was also balanced, with 58.33% males and 41.67% females in the EFG, compared to 53.33% males and 46.67% females in the DFG (p=0.57). The mean BMI was slightly higher in the delayed feeding group (25.20 ± 3.50 kg/m²) than in the early feeding group (24.80 ± 3.70 kg/m²), but the difference was not statistically significant (p=0.48). The ASA classification, an indicator of preoperative physical status, was also similar between the two groups, ensuring that both groups had comparable baseline health statuses.

Table 2: Surgical Characteristics

The surgical characteristics were also comparable between the two groups. The mean surgery duration was slightly higher in the delayed feeding group (145.20 ± 27.30 minutes) compared to the early feeding group (142.50 ± 25.60 minutes), but the difference was not statistically significant (p=0.78). The distribution of different surgical procedures was similar, with gastrectomy performed in 36.67% of EFG patients and 33.33% of DFG patients (p=0.72), bowel resection in 33.33% vs. 36.67% (p=0.65), and colorectal surgery in 30.00% of both groups (p=1.00). These findings confirm that surgical intervention type did not introduce bias in the comparison of postoperative outcomes.

Table 3: Primary Outcomes

Significant differences were observed in primary recovery outcomes between the two groups. Time to first flatus, an important indicator of gastrointestinal recovery, was significantly shorter in the early feeding group (33.60 ± 5.80 hours) compared to the delayed feeding group (47.10 ± 7.10 hours, p<0.001). Similarly, time to first bowel movement was 55.20 ± 6.30 hours in EFG and 70.50 ± 8.20 hours in DFG, with a highly significant difference (p<0.001), indicating faster bowel function recovery with early feeding. Length of hospital stay was also significantly reduced in EFG (6.80 ± 1.20 days) compared to DFG (8.40 ± 1.50 days, p<0.001), suggesting that early feeding contributes to faster overall recovery. Moreover, the incidence of postoperative ileus was lower in EFG (8.33%) compared to DFG (21.67%, p=0.03), highlighting the protective role of early feeding in preventing ileus.

Table 4: Secondary Outcomes

The secondary outcomes, including postoperative complications and patient satisfaction, showed some trends favoring early feeding, although most were not statistically significant. Anastomotic leak rates were slightly lower in EFG (5.00%) than in DFG (8.33%), but the difference was not significant (p=0.71). The infection rate was 10.00% in EFG and 15.00% in DFG, without significant differences (p=0.42). However, nausea and vomiting were more frequent in the delayed feeding group (25.00%) compared to EFG (13.33%), but this difference approached significance (p=0.08). The readmission rate within 30 days was lower in the early feeding group (6.67%) compared to the delayed feeding group (11.67%, p=0.38), although not statistically significant. Importantly, patient satisfaction scores were significantly higher in the early feeding group (8.50 ± 1.10) compared to the delayed feeding group (7.20 ± 1.30, p<0.001), indicating that patients preferred early feeding and found it beneficial for their recovery.

Table 5: Postoperative Complications

Postoperative complications, including wound infection (6.67% in EFG vs. 11.67% in DFG, p=0.52), pneumonia (3.33% vs. 8.33%, p=0.44), urinary tract infections (5.00% vs. 8.33%, p=0.71), deep vein thrombosis (1.67% vs. 3.33%, p=0.56), and sepsis (3.33% vs. 6.67%, p=0.42), did not differ significantly between the groups. These findings suggest that early feeding does not increase the risk of serious postoperative complications.

Table 6: Multiple Regression Analysis

Multiple regression analysis was conducted to determine whether early feeding independently influenced key recovery parameters. The results showed that early feeding was significantly associated with a shorter time to first flatus (β = -1.25, p=0.001) and first bowel movement (β = -1.80, p=0.002), indicating that early feeding is a strong predictor of faster return of gastrointestinal function. Additionally, length of hospital stay was significantly reduced (β = -0.75, p=0.009) in patients who received early feeding. The risk of postoperative ileus was also significantly lower with early feeding (β = -0.12, p=0.032). The R^2 value of 0.78 suggests a strong model fit, meaning that early feeding plays a substantial role in influencing these outcomes.

Table 1: Patient Demographics

Characteristic	Early Feeding Group (n=60)	Delayed Feeding Group (n=60)	p-value
Age (years, mean ± SD)	56.30 ± 9.20	57.10 ± 8.80	0.62
Male (%)	35 (58.33)	32 (53.33)	0.57
Female (%)	25 (41.67)	28 (46.67)	0.57
BMI (kg/m², mean ± SD)	24.80 ± 3.70	25.20 ± 3.50	0.48
ASA I (%)	18 (30.00)	16 (26.67)	0.67
ASA II (%)	30 (50.00)	31 (51.67)	0.89
ASA III (%)	12 (20.00)	13 (21.67)	0.81

Table 2: Surgical Characteristics

Characteristic	Early Feeding Group (n=60)	Delayed Feeding Group (n=60)	p-value
Surgery Duration (min, mean ± SD)	142.50 ± 25.60	145.20 ± 27.30	0.78
Gastrectomy (%)	22 (36.67)	20 (33.33)	0.72
Bowel Resection (%)	20 (33.33)	22 (36.67)	0.65
Colorectal Surgery (%)	18 (30.00)	18 (30.00)	1.00

Table 3: Primary Outcomes

Outcome	Early Feeding Group (n=60)	Delayed Feeding Group (n=60)	p-value
Time to First Flatus (hours, mean ± SD)	33.60 ± 5.80	47.10 ± 7.10	<0.001
Time to First Bowel Movement (hours, mean ± SD)	55.20 ± 6.30	70.50 ± 8.20	<0.001
Length of Hospital Stay (days, mean ± SD)	6.80 ± 1.20	8.40 ± 1.50	<0.001
Incidence of Postoperative Ileus (%)	5 (8.33)	13 (21.67)	0.03

Table 4: Secondary Outcomes

Outcome	Early Feeding Group (n=60)	Delayed Feeding Group (n=60)	p-value
Anastomotic Leak (%)	3 (5.00)	5 (8.33)	0.71
Infection (%)	6 (10.00)	9 (15.00)	0.42
Nausea/Vomiting (%)	8 (13.33)	15 (25.00)	0.08
Readmission Rate within 30 Days (%)	4 (6.67)	7 (11.67)	0.38
Patient Satisfaction Score (1-10, mean ± SD)	8.50 ± 1.10	7.20 ± 1.30	<0.001

Table 5: Postoperative Complications

Complication	Early Feeding Group (n=60)	Delayed Feeding Group (n=60)	p-value
Wound Infection (%)	4 (6.67)	7 (11.67)	0.52
Pneumonia (%)	2 (3.33)	5 (8.33)	0.44
Urinary Tract Infection (%)	3 (5.00)	5 (8.33)	0.71
Deep Vein Thrombosis (%)	1 (1.67)	2 (3.33)	0.56

Sepsis (%)	2 (3.33)	4 (6.67)	0.42

Table 6: Multiple Regression Analysis

Variable	Coefficient (β)	Standard Error	p-value
Time to First Flatus (hours)	-1.25	0.35	0.001
Time to First Bowel Movement (hours)	-1.80	0.42	0.002
Length of Hospital Stay (days)	-0.75	0.28	0.009
Incidence of Postoperative Ileus	-0.12	0.05	0.032

DISCUSSIONS

Postoperative nutritional management plays a crucial role in patient recovery following gastrointestinal surgery. Traditionally, delayed oral feeding has been practiced due to concerns about anastomotic leakage, ileus, and other complications. However, recent evidence supports early oral feeding as a safe and effective strategy that enhances gastrointestinal function, shortens hospital stay, and improves overall patient outcomes. Early enteral nutrition is now widely recommended as part of enhanced recovery after surgery (ERAS) protocols, emphasizing the importance of early mobilization and nutritional support to promote faster recovery. The present study aimed to compare early versus delayed feeding in patients undergoing gastrointestinal surgery, assessing key outcomes such as gastrointestinal recovery, length of hospital stay, incidence of postoperative ileus, and overall patient satisfaction. Our study found that early feeding significantly reduced time to first flatus (33.60 ± 5.80 hours vs. 47.10 ± 7.10 hours, $p<0.001$) and time to first bowel movement (55.20 ± 6.30 hours vs. 70.50 ± 8.20 hours, $p<0.001$) compared to delayed feeding. These findings are supported by Deng et al. (2022), who reported that early oral feeding after upper gastrointestinal surgery significantly shortened the time to first flatus by 0.39 days and first stool passage by 0.99 days.[7] Similarly, Willcutts et al. (2016) found that early postoperative oral feeding was associated with a shorter time to bowel function recovery, reducing time to first flatus by 12 to 24 hours compared to delayed feeding. The underlying mechanism of this improvement is likely related to early stimulation of gastrointestinal motility, reduced bowel edema, and prevention of gut mucosal atrophy, which are commonly associated with prolonged fasting.[8]

The length of hospital stay was significantly reduced in our study among patients who received early feeding (6.80 ± 1.20 days vs. 8.40 ± 1.50 days, $p<0.001$). These results are in agreement with Osland et al. (2011), who found that early postoperative oral feeding was associated with a shorter hospital stay by 1.72 days in gastrointestinal surgery patients compared to delayed feeding.[9] Similarly, Deng et al. (2022) reported a hospital stay reduction of 1.30 days in patients who received early oral feeding. This reduction is clinically significant, as shorter hospital stays not only decrease healthcare costs but also reduce the risk of hospital-acquired infections and improve overall patient recovery.[7]

The incidence of postoperative ileus was significantly lower in the early feeding group in our study (8.33% vs. 21.67%, $p=0.03$). This finding is supported by Canzan et al. (2024), who reported that early oral feeding reduces the risk of postoperative ileus with a relative risk of 0.69. The proposed mechanism for this benefit includes earlier activation of intestinal peristalsis, reduction in inflammatory responses, and maintenance of gut integrity. [10] A study by Boelens et al. (2014) also found that early oral feeding reduced ileus incidence from 23.0% to 9.7%, further supporting the evidence that early enteral nutrition plays a protective role against ileus development. [11]

Our study found no significant differences in major postoperative complications such as anastomotic leaks (5.00% vs. 8.33%, $p=0.71$), wound infections (6.67% vs. 11.67%, $p=0.52$), and sepsis (3.33% vs. 6.67%, $p=0.42$) between the two groups. These findings are in line with Deng et al. (2022), who reported that early oral feeding did not increase the risk of anastomotic leakage, pneumonia, or wound infections.[7] Additionally, patient satisfaction scores were significantly higher in the early feeding group in our study (8.50 ± 1.10 vs. 7.20 ± 1.30, $p<0.001$), which is consistent with Cecchini et al. (2018), who found that early feeding improved patient comfort, reduced nausea, and led to better overall satisfaction. The likely explanation for this is the earlier return to normal dietary habits, reduced fasting-related discomfort, and a greater sense of overall well-being.[12]

Our multiple regression analysis indicated that early feeding was an independent predictor of faster gastrointestinal recovery and a reduced length of hospital stay. The regression coefficients showed that early feeding significantly influenced time to first flatus ($\beta = -1.25$, $p=0.001$), time to first bowel movement ($\beta = -1.80$, $p=0.002$), and length of hospital stay ($\beta = -0.75$, $p=0.009$). The R^2 value of 0.78 suggests that early feeding is a substantial contributor to postoperative recovery. These findings align with Schwenk et al. (2006), who reported that early feeding as part of ERAS programs led to a 30% reduction in hospital stay and improved overall recovery in colorectal surgery patients.[13]

CONCLUSION

In conclusion, the debate between early and delayed feeding after gastrointestinal surgery has shifted in favor of early nutrition due to its benefits in promoting faster recovery, reducing complications, and shortening hospital stays. While traditional practices emphasized bowel rest, modern evidence supports the role of early feeding in enhancing gut motility, preventing infections, and improving overall surgical outcomes. However, patient selection remains crucial, as certain high-risk cases may require a more cautious approach. Integrating evidence-based feeding strategies into postoperative care can optimize recovery and improve patient well-being.

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